

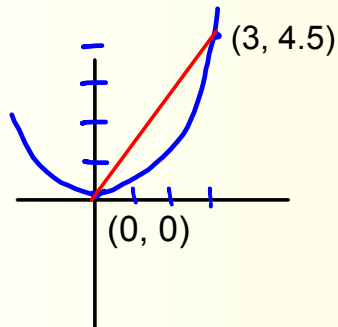
**Warm Up #10-2**

1. Find the point-slope equation of the line through the given points:

a)  $(4, -2)$  &  $(8, -4)$

b)  $(5, 10)$  &  $(-9, -2)$

2. Find the slope of the line segment:



HW Questions:

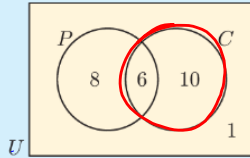
## Conditional Probability

$A | B$  is used to represent that “ $A$  occurs knowing that  $B$  has occurred”.  
 $A | B$  is read as “ $A$  given  $B$ ”.

In a class of 25 students, 14 like pizza and 16 like iced coffee. One student likes neither and 6 students like both. One student is randomly selected from the class. What is the probability that the student:

a) likes pizza

b) likes pizza given that he or she likes iced coffee?



$$a) P(P) = \frac{14}{25}$$

$$b) P(P|C) = \frac{6}{16}$$

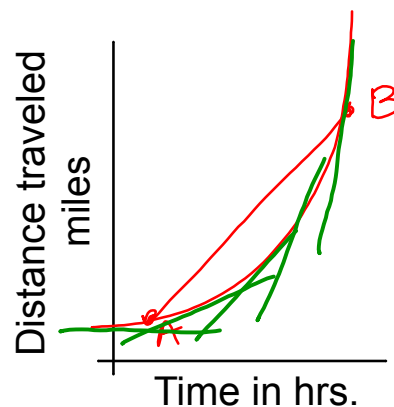
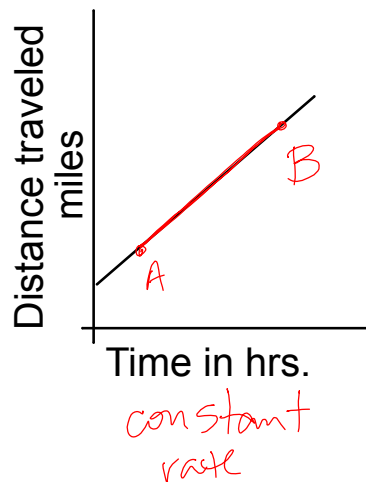
$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$= \frac{\frac{6}{25}}{\frac{16}{25}} \rightarrow \frac{6}{25} \cdot \frac{25}{16}$$

## Intro to Differential Calculus (from yesterday)

$$\text{Average Rate of Change} = \frac{\Delta y}{\Delta x}$$

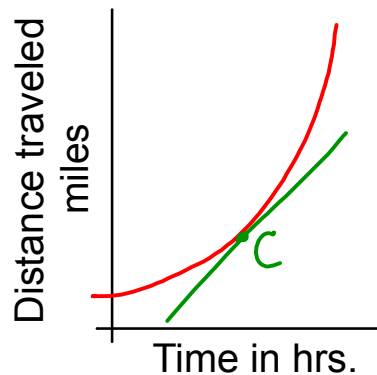
slope between  
2 points



## Instantaneous Rate of Change

The rate of change at a particular point

This rate of change = slope of the tangent line at that point.



Classwork:

Differentiation: The process of finding the derivative.

$$y = ax^n$$

Derivative:  $y' = a(n)x^{n-1}$

$$y = x^2$$

$$y' = 1(2)x^{2-1}$$

$$y' = 2x$$

$$y = x^3$$

$$y' = 3x^2$$

$$y = x^4$$

$$y' = 4x^3$$

Other notation:

$$y' = a(n)x^{n-1}$$

$$y = 8x^0$$

$$\frac{dy}{dx} = 8(0)x^{0-1}$$

$$= 0$$

$$y = 3x^2 + 7$$

$$\frac{dy}{dx} = 6x$$

$$f(x) = 4x^2 - 5x + 7$$

$$f'(x) = 8x - 5x^0 \neq 0$$

$$f'(x) = 8x - 5$$

$$f(x) = \frac{x^3 - 5x + 8}{x}$$

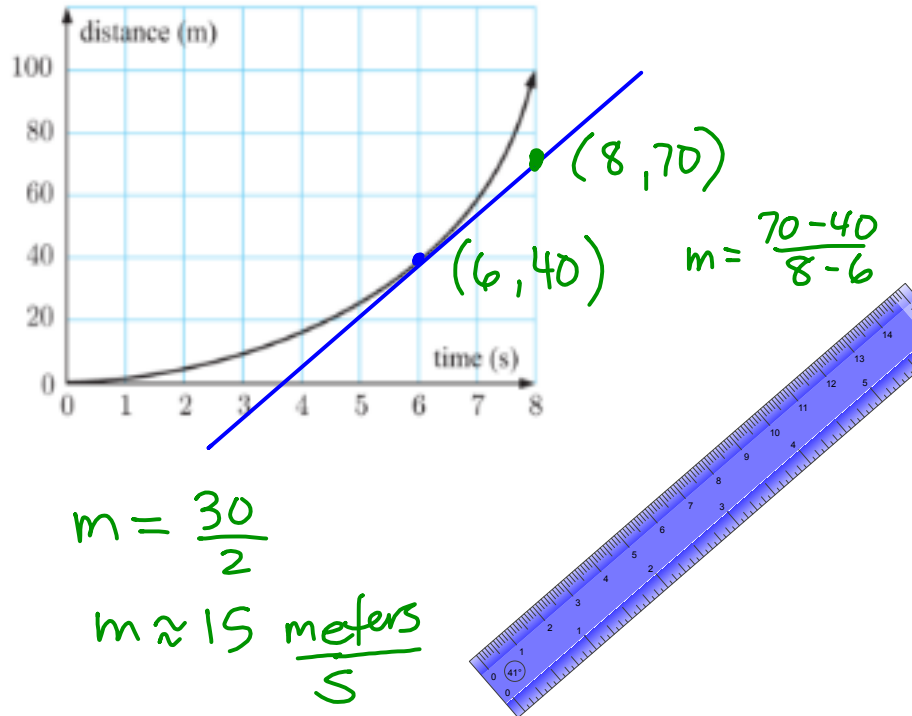
Rewrite

$$f(x) = \frac{x^3}{x} - \frac{5x}{x} + \frac{8}{x}$$

$$f(x) = x^2 - 5 + 8x^{-1}$$

$$f'(x) = 2x + 0 + 8(-1)x^{-1-1}$$

$$f'(x) = 2x - \frac{8}{x^2}$$



Last of today's Classwork:

20B.1 p. 565, # 1 & 2

HW: 9J p. 291, # 1 - 8

$$\star P(A | B) = \frac{P(A \cap B)}{P(B)}$$